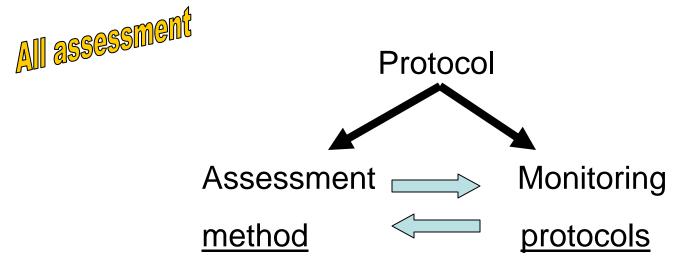


## **Definitions**

Protocols: How to collect data. Focus standardized sampling. e.g., Directions for collecting and processing macroinvertebrates. Data then used in IBI (assessment method or monitoring protocol)

Protocols used in: Assessment method and Monitoring



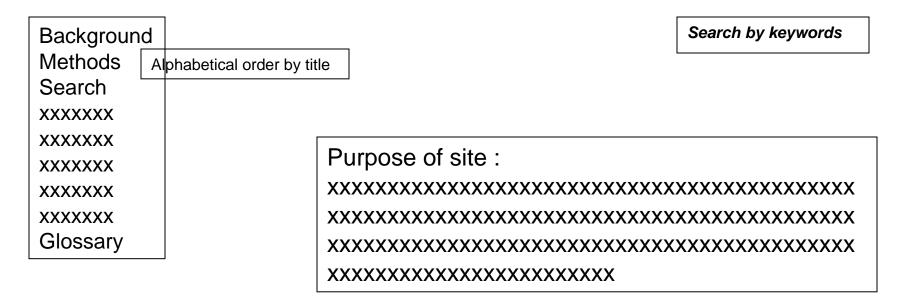
## Goal - develop web based compendium:

- Method summaries
- ☐ Several ways to query

## What we've achieved:

- √ 600 references
- ✓ Preliminary screening .....variety of documents
- √ Web database
- ✓ Web query sort thru methods

#### METHODS FOR ECOLOGICAL ASSESSMENT



**1. Summaries**. Go directly to:

Assessment methods
Inventory methods
Overview documents on classification
Overview documents on assessment

- **2. Search** following query
- 3. Compare 2-3 methods.
- 4. Locate specific indicators/models
- 5. Master list of references

## Select type of document

## Other documents

### Classification:

Summary of several classification systems

Description of one classification system

Description of sampling protocols (how to collect data)

General guidance/approaches to conducting an inventory

### Assessment:

Summary of several assessment methods

Approaches to assessment methods

Conceptual plans for conducting an assessment

Guidance on model development (e.g., HGM guidebooks)

Description of sampling protocols (how to collect data)

Numerical simulation models

## <u>Methods</u>

Inventory (classification system with application, e.g. NWI)

**Assessment** 



### **PROTOCOL DATABASE**

PROTOCOL NAME	PARK	STATUS	SUMMARY	PROTOCOL
Air Quality	DENA	Completed, but needs revision to meet NPS standards	Summary	
Amphibians	CACO	Completed, but needs revision to meet NPS standards	Summary	<u>Protocol</u>
Bald Eagles	NOCA	Completed, but needs revision to meet NPS standards	Summary	
Bats	ORPI	Legacy protocol, for informational purposes	Summary	Protocol
Black Bear	GRSM	Completed, but needs revision to meet NPS standards	Summary	
Black-tailed Prairie Dog	PRCL	Completed, but needs revision to meet NPS standards	Summary	<u>Protocol</u>
Coral Colonies	VIIS	Research and Development phase	Summary	<u>Protocol</u>
Coral Reef Video Protocol	VIIS	Completed, but needs revision to meet NPS standards	Summary	<u>Protocol</u>
Coral Reefs	VIIS	Completed, but needs revision to meet NPS standards	Summary	Protocol

http://science.nature.nps.gov/im/monitor/protocoldb.cfm

## Select type of document

## Other documents

### Classification:

Summary of several classification systems

Description of one classification system

Description of sampling protocols (how to collect data)

General guidance/approaches to conducting an inventory

### Assessment:

Summary of several assessment methods

Approaches to assessment methods

Conceptual plans for conducting an assessment

Guidance on model development (e.g., HGM guidebooks)

Description of sampling protocols (how to collect data)

Numerical simulation models

## ➤ Methods

Inventory (classification system with application, e.g. NWI)

- Assessment
  - ➤ List all or sort by query

## Purpose of method \*required Inventory Assess **Specific purpose** \*Stream methods only Biological assessment Physical habitat assessment Morphological assessment / channel stability **Input Data** Method based only on maps, photos, or GIS analysis (may include panchromatic, true color, color IR photos; multi/hyperspectral data; satellite imagery). Method based on field data (may include GIS component) Method based on field data - AND - requires lab analysis or taxonomic analysis subsequent to field collection.

### **Basis for Defining Unit of Analysis**

- Ecoregion
- Watershed
- Sub-watershed or catchment
- Stream reach
- Discrete site (based on rules defined in method)

### **Output - Units of Measure**

- Descriptive (e.g., text description of condition)
- Nominal scale
  - (e.g., high, medium, low ratings; Proper Functioning Condition)
- Ordinal scale
  - (e.g., 0 1 scale; HGM Approach FCIs; IBIs)
- Quantitative
  - (e.g., number of organisms, stream flow, water chemistry)

**General Categories** (If you select more than one, query will list methods with one or more selections)

- Habitat (e.g., habitat suitability, biological integrity)
- Biogeochemistry and water quality for aquatic life
- Hydrologic integrity
- Physical structure and geomorphic integrity
- Landscape condition (e.g., connectivity)
- Societal values and uses (e.g., recreation)

### **Habitat Types**

#### Terrestrial Tidal Wetland Tidal Open □ Forest Vegetated Water ■ Non-vegetated Shrubland ☐ Tidal rivers & ☐ Herbaceous streams (e.g., prairie, grassland) **Nontidal Open** ■ Other tidal open ■ Sparsely vegetated Water water (e.g., dune, rock outcrop, Standing beach) water bodies (e.g., Miscellaneous: Desert & barrenland lakes, ponds & reservoirs) ☐ Glaciers & ■ Wadeable rivers & snowfields Riparian streams Other \_\_\_\_\_ ■ Woody □ Non-wadeable ■ Non-woody rivers & streams ☐ Intermittent & Check if applicable: Nontidal Wetlands ephemeral ■ Watershed context Vegetated streams ■ Non-vegetated ☐ Urban drainages **Habitat key words:**

### Geographic Area

- □ Alaska
- □ Intermountain
- Midwest
- National capital area
- Northeast
- Pacific West
- Southeast
- □ Pacific (Hawaii, Guam, American Somoa)
- Atlantic (Puerto Rico, Virgin Islands)

Estimate Time (assumes method/models available; background information such as maps collected)

- 🔲 Less than ½ day
- Entire day
- Multiple days
- Week or longer

**SUBMIT** 

	Search Results
Name	Reference
Bird Community Index for the Mid-Atlantic Highlands	O'Connell, T.J., L.E. Jackson, and R.P. Brooks. 1998. A bird community index of biotic integrity for the Mid-Atlantic Highlands Environmental Monitoring and Assessment 51(1-2): 145-156.
<u>CRAM</u>	Collins, J.S., E. Stein, and M. Sutula. 2004. (Draft). California rapid assessment method for wetlands, version 2.0. Retrieved February 1, 2004 from San Francisco Bay area wetlands regional monitoring program web site http://www.wrmp.org/index.html
Modified Wetland Functional Assessment Protocol - MD	Taylor, S., S. Findley, and L. Miller. 1997. Potomac sub-region wetland functional assessment study. Piney Branch and Watts Branch Watersheds. Need city, state
New Hampshire Method	Ammann, A.P., and A.L. Stone. 1991. Method for the comparative evaluation of nontidal wetlands in New Hampshire. NHDES-WRD-1991-3. New Hampshire Department of Environmental Services, Concord, N.H.
NPS Disturbed Lands Inventory and Assessment Protocol	USDI National Park Service. (n.d.). Disturbed lands inventory and assessment protocol. National Park Service. Retrieved June 14, 2004 from http://science.nature.nps.gov/im/monitor/Protocols/inv_DisturbedLandsProtocol.pdf
Numerical Method for Evaluation of Maine Peatlands	Davis, R.B., and D.S. Anderson. 1999. A numberical method and supporting database for evaluation of Maine peatlands as candidate natural areas. Technical Bulletin 175. Department of Biological Sciences, University of Maine, Orono, ME.
Quantitative Habitat Analysis	Marsh, L.K. and T. Haarmann. 2004. Quantitative habitat analysis: A new tool for the integration of modeling, planning, and managaeent of natural resources. Pages 94-106 in L. Kapustka, H. Gailbraith, M. Luxon, and G. Biddinger, editors.
Wetland Assessment Procedure - Draft (2004)	Southwest Florida Water Management District. 2004. Northern Tampa Bay phase II: wetland assessment procedure revisions - 2004. Retrieved July 16, 2004 from Southwest Florida Mangement District website: http://www.swfwmd.state.fl.us/Default.htm
Wetland Value Assessment Methodology	Environmental Work Group. 2002. Coastal wetlands planning, protection and restoration act, wetland value assessment methodology. Procedural Manual. U.S. Fish and Wildlife Service, Lafayette, LA.
Click method	

### **ABBREVIATED TITLE (Acronym)**

Publication Availability: Hard copy and web download

Web Address: www.mysite.com

Sample data sheet: link to pdf file.

CONTACT INFORMATION

DOCUMENT CONTENT: Guidance on model development

Method: Assessment

**Keywords (Objectives):** xxxxx, xxxxx, xxxxx, xxxxx, Keywords (Habitat): xxxxx, xxxxx, xxxxx, xxxxx,

INPUT DATA: maps, photos, or GIS analysis xxxxxxxxxx

•

Guidance for defining boundaries of unit of analysis: xxxx

#### **OUTPUT – UNITS OF MEASURE**

Descriptive

Nominal scale (e.g. high, medium, low ratings)

Ordinal scale (e.g. 0-1 scale)

Quantitative (e.g. number of organisms)

### REFERENCE CONDITION

Documentation explaining how reference is determined: xxxx Method/model describes site relative to: Culturally unaltered

Applicable habitat type as described in document xxxxxxxxxx

**GEOGRAPHIC AREA:** 

Regions where applicable: Alaska (AK)

Applicable geographic area as described in document: xxxxx

**Application to new areas:** No modification needed

GENERAL & SPECIFIC CATEGORIES ADDRESSED IN DOCUMENT:

How method addresses size of the individual unit being assessed?

**EXPERTISE:** 

If applicable, estimate time for model development:

NATIONAL PARK SERVICE: Strengths/weaknesses of this method with regard to use for determining the desired future condition.

YES/NO: Method provides a set list of metrics/indicators that should be measured/estimated. This is in contrast to methods that provide a list of considerations that may or may not be used in assessing condition.

YES/NO: Method attempts to identify stressor/disturbance factors that cause departure from reference.

YES/NO: Method can be characterized as "repeatable" between different users.

# Side by side comparison

	Method A	Method B	Method C
Purpose			
Related methods			
Input			
Basis for defining boundaries			
Categories (habitat, water quality)			
Time estimate			
Basis for defining reference condition			
Expertise needed			
Recommended training			

## Key word search (objectives)

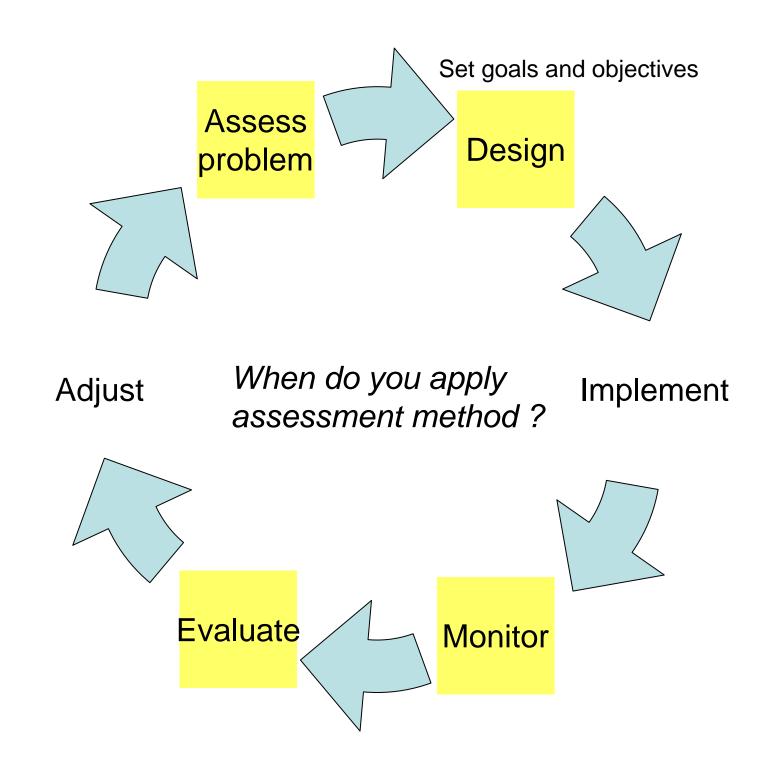
Channel stability Disturbance **Erosion** Fire management Geographic Information Systems (GIS) **Grazing effects** Invasive species Mining effects Prediction Rare & endangered species Restoration prioritization Risk assessment Satellite imagery Watershed analysis



## Reference list

Title	#	Reference	Web link
IBI - Plants	140	Taft, J.B., G.S. Wilhelm, D.M. Ladd, and L.A. Master. 1997. Floristic quality assessment in Illinois: a method for assessing vegetation integrity. Erigenia 15: 3-95.	
HGM Approach	141	Brinson, M.M. 1993. A hydrogeomorphic classification for wetlands. Wetlands Research Program Technical Report WRP-DE-4. Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksbury, MS.	
Proper Functioning Condition	257	Prichard, D., H. Barrett, J. Cagney, R. Clark, J. Fogg, K. Gebhardt, P.L. Hansen, B. Mitchell, and D. Tippy. 1993. Riparian area management: process for assessing proper functioning condition. Technical Reference 1737-9, BLM/SC/ST-9/003+1737+REV95+REV98. Bureau of Land Management, Denver, CO.	http://www.blm.gov/ri parian/PDF/1737- 9.pdf
TNC Ecosystem Integrity	222	Jeffrey P., R. Unnasch, D. Braun,and G. Golet. 2003. Methods for evaluating ecosystem integrity and monitoring ecosystem response. The Nature Conservancy, San Francisco, CA.	http://sites- conserveonline.org/dc s/resources/
Watershed Vulnerability	237	Zielinski, J. 2002. Watershed vulnerability analysis. Center for Watershed Protection, Ellicott City, MD	http://www.cwp.org/V ulnerability_Analysis. pdf





	Assessment Method	Inventory and monitoring
Reference	Reference stated upfront.	Reference stated upfront –OR- data collecting for purpose of defining reference condition.
Indicators	Direct measurements. When cannot obtain use, indirect measures (e.g., % plant cover to estimate nutrient removal).	Direct measurements
Fauna	Measure habitat structure to estimate habitat suitability for particular species.	Direct observations (abundance and diversity)
Model	Primarily conceptual models. Based on 1 or more indicators that estimate/measure of condition relative to reference (optimal and/or possible range of conditions	(Assume) Validated models.
Model & outputs when > 1 assessment category	Standardized model output and format	Different formats for reporting condition depending upon assessment category.
Time	Low (rapid) to high	High

Data from I&M can be used to validate assessment method models. Assessment methods can be used for I&M

Inventory & Monitoring	Assessment methods	Other documents – list in Compendium
Protocols		Protocols
Comprehensive models	"Rapid assessment "models	Comprehensive models
Inventory – application of classification	Inventory – application of classification	
		Summaries of classifications
		Guidance inventory and monitoring plans
		Summaries of assessment methods
		Conceptual guidelines for conducting assessment
		Guidance on model development

Project	Objective	M & I	Assess. Method
Kings Canyon	Restoration Species driven  Known stressor Known action	Protocol Collect – count Monitor	Models species based on structure of habitat Site suitability Restore potential
Dyke Marsh	Restoration Habitat driven  Unknown stressors Unknown action(s)	Done	General and species models  Formalize thought process in general terms so can ID stressors, ID potential actions.

# **Types of Documents Reviewed**

- Guidebooks for how to conduct watershed assessment
- Conceptual approaches or strategies for assessment
- Field protocols for data collection
- Numerical simulation models
- Sample planning or case studies (may or may not include a specific assessment method)
- Reviews or critiques of assessment methods
- Scientific studies relevant to assessment (e.g. effect of land-use on amphibian populations)
- Classification systems
- Assessment method details and procedures